

**WHAT IS CLAIMED IS:**

1. Chemokine peptide 3, a variant, or a derivative thereof.
2. Chemokine peptide 2, a variant, or a derivative thereof.
3. The peptide of claim 1 wherein the chemokine is not IL8 or NAP-2.
4. The peptide of claim 1 which is a variant of peptide 3[MCP-1].
5. The peptide of claim 4 which is Leu<sub>4</sub>Ile<sub>11</sub>peptide 3(3-12)[MCP-1].
6. The peptide of claim 1 or 2 which is a CC chemokine.
7. The peptide of claim 6 wherein the CC chemokine is MCP-1, RANTES, MCP-2, MCP-3, MCP-4, eotaxin, MIP1 $\alpha$ , MIP1 $\beta$ , LARC, I309, HCC-1, TARC or Ck $\beta$ 8.
8. The peptide of claim 1 or 2 which is a CXC chemokine.
9. The peptide of claim 8 wherein the CXC chemokine is IP-10, PF-4, SDF-1, NAP-2, GRO $\alpha$ , GRO $\beta$ , GRO $\gamma$  or ENA78.
10. The peptide of claim 8 wherein the CXC chemokine is IL-8, IP-10, SDF-1, PF-4, NAP-2, GRO $\alpha$ , GRO $\beta$ , GRO $\gamma$ , NAP-2 or ENA78.
11. A CRD derivative of chemokine peptide 3 or a variant thereof.

12. The derivative of claim 11 which is CRD-Cys<sub>13</sub>Leu<sub>4</sub>Ile<sub>11</sub>peptide 3(3-12)[MCP-1].

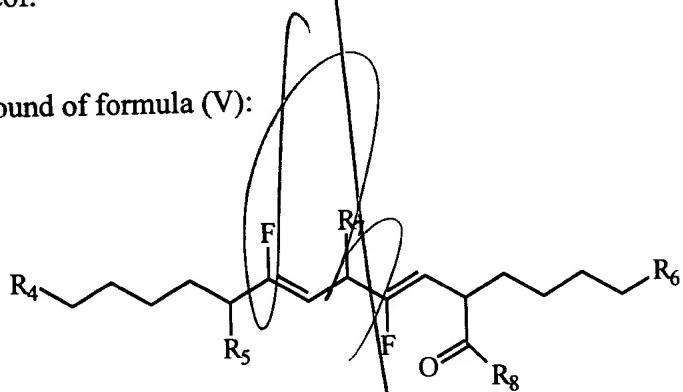
13. A CRD derivative of chemokine peptide 2 or a variant thereof.

14. A compound of formula (IV):



wherein R<sup>1</sup> is aryl, heteroaryl, coumaryl or chromanyl; wherein R<sup>2</sup> is N(R<sup>a</sup>)(R<sup>b</sup>); wherein R<sup>3</sup> is N(R<sup>c</sup>)(R<sup>d</sup>); wherein Y is oxo or thioxo; wherein Z is (C<sub>1</sub>-C<sub>10</sub>)alkyl; wherein R<sup>a</sup>-R<sup>d</sup> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkanoyl, phenyl, benzyl or phenethyl; or wherein R<sup>a</sup> and R<sup>b</sup>, or R<sup>c</sup> and R<sup>d</sup>, together with the nitrogen to which they are attached form a pyrrolidino, piperidino or morpholino ring; or a pharmaceutically acceptable salt thereof.

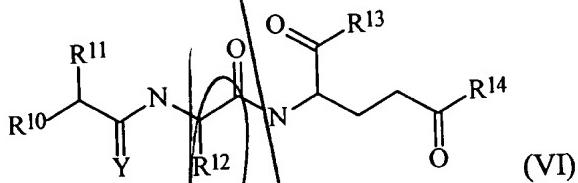
15. A compound of formula (V):



wherein R<sup>4</sup> is NR<sub>k</sub>R<sub>j</sub>; wherein R<sup>5</sup> is NR<sub>m</sub>R<sub>n</sub>; wherein R<sup>6</sup> is NR<sub>o</sub>R<sub>p</sub>; wherein R<sup>7</sup> is NR<sub>q</sub>R<sub>r</sub>; wherein R<sup>8</sup> is hydrogen, hydroxy, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl,

(C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy, NR<sub>s</sub>R<sub>t</sub>, the N-terminal residue of an amino acid or a peptide of 2 to about 25 amino acid residues; wherein R<sub>k</sub>, R<sub>l</sub>, R<sub>m</sub>, and R<sub>p</sub> are each hydrogen; wherein R<sub>m</sub> and R<sub>n</sub> are each independently hydrogen, acetyl, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, propoxy, butoxy, *tert*-butoxycarbonyl, 9-fluorenylmethoxycarbonyl, the C-terminal residue of an amino acid or a peptide of 2 to about 25 amino acid residues; wherein R<sub>q</sub> and R<sub>r</sub> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, or (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl; and wherein R<sub>s</sub> are R<sub>t</sub> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, phenyl, benzyl, or phenethyl; or a pharmaceutically acceptable salt thereof.

16. A compound of formula (VI):



wherein R<sup>10</sup> is NR<sup>i</sup>R<sup>j</sup>; R<sup>11</sup> is aryl, heteroaryl, aryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, heteroaryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, coumaryl, coumaryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, chromanyl or chromanyl(C<sub>1</sub>-C<sub>3</sub>)alkyl; wherein any aryl or heteroaryl group, or the benz-ring of any coumaryl or chromanyl group may optionally be substituted with one, two or three substituents selected from the group consisting of halo, nitro, cyano, hydroxy, (C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>6</sub>)alkoxy, (C<sub>1</sub>-C<sub>6</sub>)alkanoyl, (C<sub>2</sub>-C<sub>6</sub>)alkanoyloxy, -C(=O)(C<sub>1</sub>-C<sub>6</sub>)alkoxy, C(=O)NR<sup>g</sup>R<sup>h</sup>, NR<sup>e</sup>R<sup>f</sup>; R<sup>12</sup> is (C<sub>1</sub>-C<sub>6</sub>)alkyl; R<sup>13</sup> is (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy, hydroxy, or N(R<sup>a</sup>)(R<sup>b</sup>); R<sup>14</sup> is (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy or N(R<sup>c</sup>)(R<sup>d</sup>); Y is oxo or thioxo; and wherein R<sup>a</sup>-R<sup>j</sup> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkanoyl,

phenyl, benzyl, or phenethyl; or R<sup>a</sup> and R<sup>b</sup>, R<sup>c</sup> and R<sup>d</sup>, R<sup>e</sup> and R<sup>f</sup>, R<sup>g</sup> and R<sup>h</sup> or R<sup>i</sup> and R<sup>j</sup> together with the nitrogen to which they are attached form a ring selected from pyrrolidino, piperidino, or morpholino; or a pharmaceutically acceptable salt thereof.

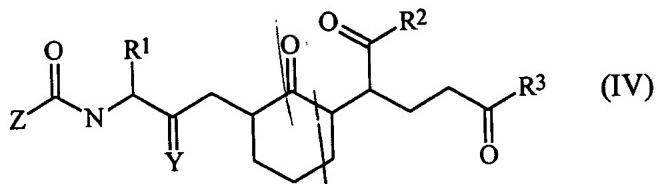
- Mb2
17. A method of preventing or inhibiting an indication associated with a chemokine-induced activity, comprising: administering to a mammal afflicted with, or at risk of, the indication an amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, or a combination thereof, effective to prevent or inhibit said activity, wherein the chemokine is not IL8 or NAP-2.
18. A method to inhibit the activity of more than one chemokine, comprising: administering to a mammal in need thereof an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
19. A method to increase or enhance a chemokine-associated inflammatory response in a mammal, comprising: administering to the mammal an amount of a chemokine peptide 2, a variant thereof, a derivative thereof, or a combination thereof effective to increase or enhance said response.
- Mb3
20. A method of preventing or inhibiting an indication associated with hematopoietic cell recruitment, comprising: administering to a mammal at risk of, or afflicted with, the indication an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.

21. A method of preventing or inhibiting an indication associated with histamine release from basophils or mast cells, comprising administering to a mammal at risk of, or afflicted with, the indication an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
22. A method to modulate the chemokine-induced activity of hematopoietic cells at a preselected physiological site, comprising: administering to a mammal a dosage form comprising an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof, wherein the dosage form is linked to a site targeting moiety.
23. A method to augment an immune response, comprising: administering to a mammal an immunogenic moiety and an amount of a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof, wherein the amount is effective to augment the immune response of the mammal to the immunogenic moiety.
24. A therapeutic method to prevent or treat a vascular indication, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof, wherein the indication is coronary artery disease, myocardial infarction, unstable angina pectoris, atherosclerosis or vasculitis.

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25. A therapeutic method to prevent or inhibit lentiviral infection or replication, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
  26. The method of claim 25 wherein the lentivirus is HIV.
  27. The method of claim 26 further comprising administering an antiviral agent before, during and/or after the administration of the peptide, a variant thereof, derivative thereof, the compound of formula (IV), the compound of formula (V), the compound of formula (VI), or a combination thereof.
  28. A therapeutic method to prevent or treat low bone mineral density, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
  29. A method of inhibiting a parasitic infection in a vertebrate animal, comprising: administering to the animal an effective amount of a chemokine peptide 2, a variant thereof, a derivative thereof, or a combination thereof.
  30. The method of claim 29 wherein the animal is a human with malaria.
  31. A therapeutic method to prevent or treat an autoimmune disease, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative

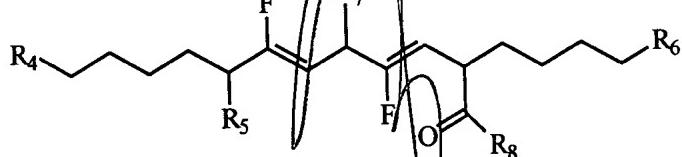
thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.

32. A method of suppressing tumor growth in a vertebrate animal, comprising: administering to said vertebrate an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
33. A method for preventing or treating psoriasis in a mammal, comprising: administering to the mammal an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
34. A method to increase or enhance hematopoietic cell-associated activity at a tumor site, comprising: administering an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
35. A method to enhance wound healing, comprising: administering an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
36. A method of treating a mammal afflicted with, or at risk of, an indication associated with chemokine-induced activity, comprising: administering to the mammal an effective amount of a compound of formula (IV):



wherein R<sup>1</sup> is aryl, heteroaryl, coumaryl or chromanyl; wherein R<sup>2</sup> is N(R<sup>a</sup>)(R<sup>b</sup>); wherein R<sup>3</sup> is N(R<sup>c</sup>)(R<sup>d</sup>); wherein Y is oxo or thioxo; wherein Z is (C<sub>1</sub>-C<sub>10</sub>)alkyl; wherein R<sup>a</sup>-R<sup>d</sup> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkanoyl, phenyl, benzyl or phenethyl; or wherein R<sup>a</sup> and R<sup>b</sup>, or R<sup>c</sup> and R<sup>d</sup>, together with the nitrogen to which they are attached form a pyrrolidino, piperidino or morpholino ring; or a pharmaceutically acceptable salt thereof.

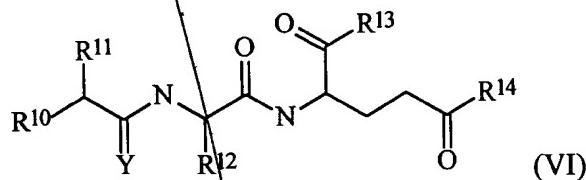
37. A method of treating a mammal afflicted with, or at risk of, an indication associated with chemokine-induced activity, comprising: administering to the mammal an effective amount of a compound of formula (V):



wherein R<sup>4</sup> is NR<sub>k</sub>R<sub>l</sub>; wherein R<sup>5</sup> is NR<sub>m</sub>R<sub>n</sub>; wherein R<sup>6</sup> is NR<sub>p</sub>R<sub>q</sub>; wherein R<sup>7</sup> is NR<sub>r</sub>R<sub>s</sub>; wherein R<sup>8</sup> is hydrogen, hydroxy, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy, NR<sub>t</sub>R<sub>u</sub>, the N-terminal residue of an amino acid or a peptide of 2 to about 25 amino acid residues; wherein R<sub>k</sub>, R<sub>l</sub>, R<sub>m</sub>, and R<sub>p</sub> are each hydrogen; wherein R<sub>n</sub> are R<sub>s</sub> are each independently hydrogen, acetyl, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, propoxy, butoxy,

*tert*-butoxycarbonyl, 9-fluorenylmethoxycarbonyl or the C-terminal residue of an amino acid or a peptide of 2 to about 25 amino acid residues; wherein R<sub>q</sub> and R<sub>r</sub> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, or (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl; and wherein R<sub>s</sub> are R<sub>t</sub> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, phenyl, benzyl, or phenethyl; or a pharmaceutically acceptable salt thereof.

38. A method of treating a mammal afflicted with, or at risk of, an indication associated with chemokine-induced activity, comprising: administering to the mammal an effective amount of a compound of formula (VI):



wherein R<sup>10</sup> is NR<sup>a</sup>R<sup>b</sup>; R<sup>11</sup> is aryl, heteroaryl, aryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, heteroaryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, coumaryl, coumaryl(C<sub>1</sub>-C<sub>3</sub>)alkyl, chromanyl or chromanyl(C<sub>1</sub>-C<sub>3</sub>)alkyl; wherein any aryl or heteroaryl group, or the benz-ring of any coumaryl or chromanyl group may optionally be substituted with one, two or three substituents selected from the group consisting of halo, nitro, cyano, hydroxy, (C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>6</sub>)alkoxy, (C<sub>1</sub>-C<sub>6</sub>)alkanoyl, (C<sub>2</sub>-C<sub>6</sub>)alkanoyloxy, -C(=O)(C<sub>1</sub>-C<sub>6</sub>)alkoxy, C(=O)NR<sup>c</sup>R<sup>d</sup>, NR<sup>e</sup>R<sup>f</sup>; R<sup>12</sup> is (C<sub>1</sub>-C<sub>6</sub>)alkyl; R<sup>13</sup> is (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy, hydroxy, or N(R<sup>a</sup>)(R<sup>b</sup>); R<sup>14</sup> is (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkoxy, (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl(C<sub>1</sub>-C<sub>6</sub>)alkoxy or N(R<sup>c</sup>)(R<sup>d</sup>); Y is oxo or thioxo; and wherein R<sup>a</sup>-R<sup>j</sup> are each independently hydrogen, (C<sub>1</sub>-C<sub>10</sub>)alkyl, (C<sub>1</sub>-C<sub>10</sub>)alkanoyl, phenyl, benzyl, or phenethyl; or R<sup>a</sup> and R<sup>b</sup>, R<sup>c</sup> and R<sup>d</sup>, R<sup>e</sup> and R<sup>f</sup>, R<sup>g</sup> and R<sup>h</sup> or R<sup>i</sup> and R<sup>j</sup> together with the nitrogen to which they are attached form a ring

selected from pyrrolidino, piperidino, or morpholino; or a pharmaceutically acceptable salt thereof.

39. An immunogenic composition comprising an immunogenic moiety and an amount of a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
40. A therapeutic method to prevent or treat asthma, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
41. The method of claim 17 wherein the amount inhibits a product or intermediate in the arachidonic acid pathway.
42. The method of claim 41 wherein leukotriene is inhibited.
43. The method of claim 41 wherein thromboxane is inhibited.
44. The method of claim 41 wherein prostaglandin is inhibited.
45. A method of preventing or inhibiting an indication associated with elevated TNF- $\alpha$ , comprising: administering to a mammal afflicted with, or at risk of, the indication an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI) or a combination thereof.

46. A peptide that includes the amino acid sequence KXK, which is a chemokine antagonist, activates TGF-beta, or a combination thereof.
47. CRD-Cys<sub>13</sub>Leu<sub>4</sub>Ile<sub>11</sub>peptide 3(3-12)[MCP-1].
48. A therapeutic method to prevent or treat organ transplant rejection, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
49. A therapeutic method to prevent or treat rheumatoid arthritis, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), a compound of formula (VI), or a combination thereof.
50. A therapeutic method to prevent or treat allergy, comprising: administering to a mammal in need of such therapy an effective amount of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), or a compound of formula (VI), or a combination thereof.
51. Use of a chemokine peptide 3, a chemokine peptide 2, a variant thereof, a derivative thereof, a compound of formula (IV), a compound of formula (V), or a compound of formula (VI), or a combination thereof for the manufacture of a medicament for the treatment of a pathological condition or symptom in a mammal which is associated with a chemokine-induced activity.

a mammal which is associated with a chemokine-induced activity.

Wolfgang

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